

Summary of Industry Trends Program Process

Collect Indicator Data

In developing the Industry Trends Program (ITP), the staff used information currently available from existing NRC programs to develop an initial set of indicators for identifying adverse industry trends. The indicators consisted of the seven indicators used by the former NRC Office for Analysis and Evaluation of Operational Data (AEOD) and the results of the Accident Sequence Precursor (ASP) Program. In addition, the staff is developing more risk-informed industry-wide indicators using data from the 18 plant-level performance indicators submitted by licensees under the Reactor Oversight Process (ROP). The staff also identified potential indicators for initiating events that are anticipated to be available from operating experience data. These indicators are being consolidated into a Baseline Risk Index for Initiating Events (BRIIE).

Identify Short-Term Issues

In fiscal year 2001 NRR adopted a statistical approach using “prediction limits” to provide a consistent method to identify potential short-term emergent issues before they become long-term trends. The prediction limits are values established at the beginning of a fiscal year that set an upper bound on expected performance for that year for each indicator. Actual indicator values during the year can then be compared to the prediction limits. Indicators that exceed the prediction limits are investigated to determine the factors influencing the data. These factors are assessed for their safety significance and used to determine an appropriate agency response. However, if obvious adverse trends emerge in the short-term data, the staff does not wait until the end of the fiscal year to initiate a review.

Identify Adverse Trends

Only long-term data is used to assess whether there are any statistically significant adverse industry trends. The trending of long-term data minimizes reactions to potential “false positive” indications that emerge in short-term data. “Short-term” is defined as less than four years to ensure that sufficient data (i.e., data for at least two typical nuclear plant operating cycles) is available to use statistical methods and to distinguish valid trends from random fluctuations in the data and operating cycle effects such as refueling outages. The staff expects that any other variations in the data are due to plant-specific issues which can be addressed under the ROP.

The staff applies common statistical techniques to the long-term indicator data to identify trends. The staff has extensively used these techniques in reactor operating experience analyses. In general terms, a trendline is fitted to each indicator using regression techniques. The slope of the trendline is then examined. An improving or flat trendline is not considered adverse and need not be investigated further. A degrading trendline is considered adverse. Statistical analysis is conducted to determine if the trendline is statistically significant.

Attachment 4

Analyze Issues

After identifying a statistically significant adverse trend, the staff conducts an initial analysis of information readily available in the databases of the indicator data to determine whether the trend is unduly influenced by a few outliers, and to identify any contributing factors. If the trend is the result of outliers, it is not considered a trend requiring generic actions, and the agency will consider appropriate plant-specific actions using the ROP. For example, the plants unduly influencing the adverse trend may have already exceeded plant-level thresholds under the ROP, and the NRC regional offices conduct supplemental inspections at these plants to ensure the appropriate corrective actions have been taken. If the plants did not exceed any thresholds, the NRC does not take regulatory actions beyond the ROP, but gathers additional information on the issue through the ROP using risk-informed baseline inspections. The results of these inspections are examined to determine if a generic issue exists requiring additional NRC review or generic inspections.

If no outliers are identified, the staff conducts a broader review to assess whether larger groups of facilities are contributing to the decline and to assess any contributing factors and causes. For example, the data review is expanded to include a review of various plant comparison groups, contributing factors such as the operational cycle stage of the facilities (shutdown, at-power, startup from refueling, etc.), and the apparent causes for the data (equipment failures, procedure problems, etc.). The staff also conducts a more detailed review of applicable licensee event reports. If a group of plants is identified, the staff examines the results of previous inspections at these plants, including the root causes and the extent of the conditions.

The staff then assesses the safety significance of the underlying issues. The staff is aware that trends in individual indicators must be considered in the larger context of their overall risk significance. For example, a hypothetical increase in automatic scrams from 0.4 to 0.7 per plant per year over several years may be a statistically significant trend in an adverse direction. However, it may not represent a significant increase in overall risk since the contribution of a few scrams is relatively low, and the overall risk may actually have declined if there have been reductions in the frequency of the more risk-significant initiating events or the reliability and availability of safety systems has improved. Depending on the issue, the staff may perform an additional evaluation using the most current risk analysis tools or an evaluation may be done by the ASP Program.

Agency Response

If a statistically significant adverse trend in safety performance is identified or an indicator crosses a prediction limit, the staff determines the appropriate response using the NRC's established processes for addressing and communicating generic issues. These processes are described in SECY-99-143, "Revisions to Generic Communications Program."

In general, the issues are assigned to the appropriate branch of NRR for initial review. The branch engages NRC senior management and initiates early interaction with the nuclear power industry. Depending on the issue, the agency may ask industry groups such as NEI and owners groups to provide utility information. As discussed in SECY-00-0116, "Industry Initiatives in the Regulatory Process," industry initiatives, such as the formation of specialized working groups to address technical issues, may be used in lieu of, or to complement, regulatory actions. This can benefit both the NRC and the industry by identifying mutually satisfactory resolution approaches and reducing resource burdens.

Depending on the issues, the NRC may consider generic safety inspections at plants. In addition, RES may address the issues underlying the adverse trend as part of the generic safety issue process. The NRC may also consider additional regulatory actions as appropriate, such as issuing generic correspondence to disseminate or gather information or conducting special inspections for generic issues. The NRC may also implement changes to the inspection and licensing programs if necessary. The process also includes consideration of whether any actions proposed by the NRC to address the issues constitute a backfit.

Senior Management Review

The industry trends program, results, and agency responses are reviewed annually during the Agency Action Review Meeting (AARM). In general, the AARM reviews the appropriateness and effectiveness of staff actions already taken, rather than deciding on agency actions. NRC senior managers review the industry trends information and, if appropriate, recommend any additional actions beyond those implemented by the staff.

Communicating With Stakeholders

The NRC communicates overall industry performance to stakeholders by publishing the ITP indicators on the agency's public Web site at <http://www.nrc.gov/reactors/operating/oversight/industry-trends.html>. The staff believes that communication of the industry-level indicators, together with the information on individual plants from the ROP, enhances stakeholder confidence in the effectiveness of the NRC's oversight of the nuclear industry.

The staff informs the Commission of the results of the ITP in an annual report in the same timeframe as the AARM. The indicators are also published annually in the NRC's "Information Digest 200X" (NUREG-1350 series). In addition, NRC managers have historically presented industry indicators and trends at major conferences with industry.

Reporting to Congress

The NRC reports the industry indicators to Congress annually in the NRC's "Performance and Accountability Report, Fiscal Year 200X" (NUREG-1542 series) and in the NRC's "Budget Estimates and Performance Plan, Fiscal Year 200X" (NUREG-1100 series). The indicators demonstrate how successfully the agency has met the performance goal measure of "statistically significant adverse industry trends in safety performance" for maintaining safety. Statistically significant adverse trends are reported, but indicators that exceeded prediction limits need not be included in these reports since the prediction limits are tools for monitoring industry performance rather than desired thresholds of performance.

The Commission has historically used the ITP indicators in presenting the status of industry performance to the NRC's oversight committees.